



## TC-60™ Shaft Sleeves ... the Heart of the Matter

**TC-60™** protects pump & mixer shaft sleeves against corrosion and erosion, makes them last twice as long.

Applied under controlled conditions and precision ground, ultra-smooth extra hard **TC-60™** is over 60 on the Rockwell 'C' scale. Cuts wear, cuts cost, naturally extends life.

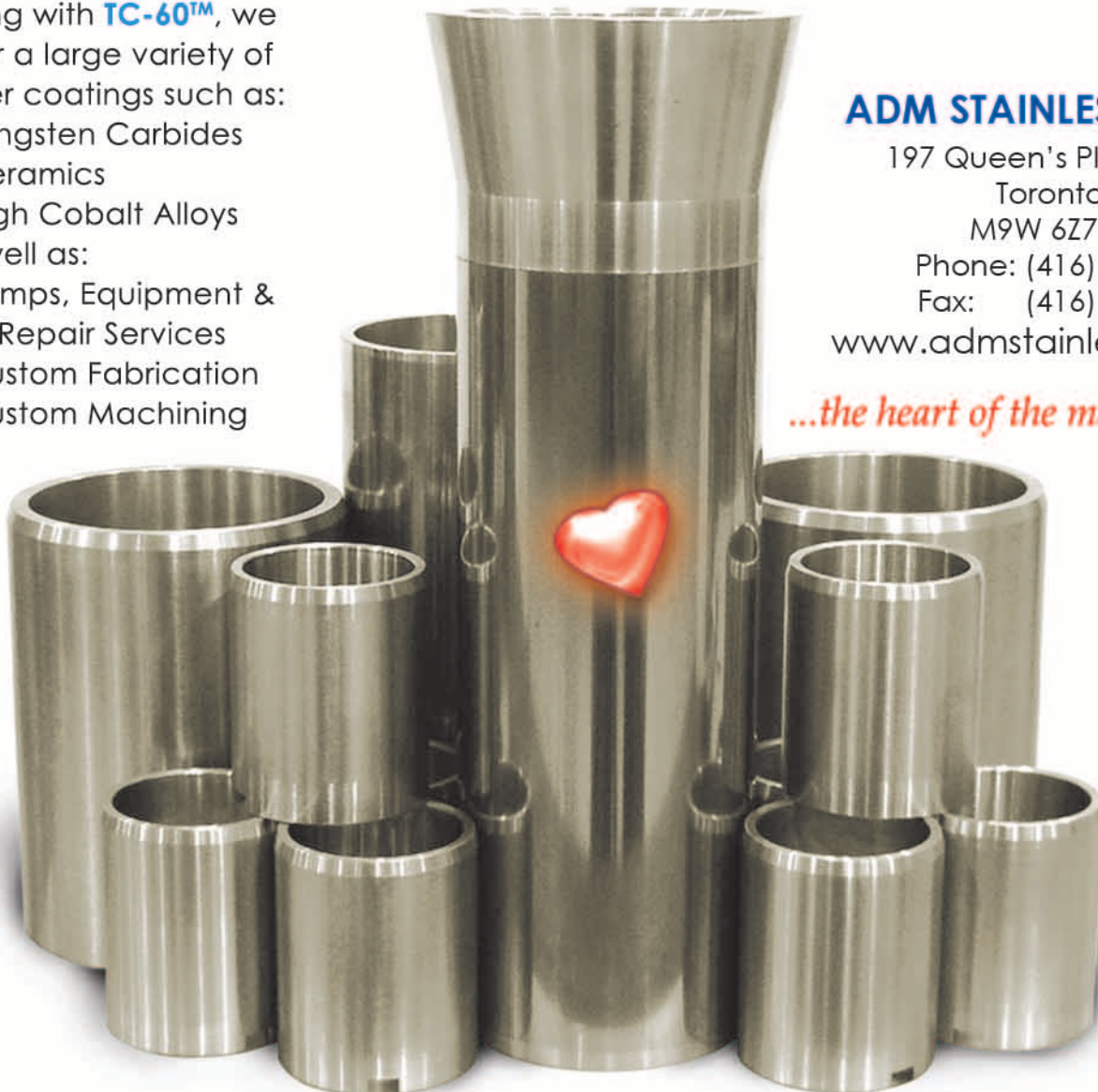
ADM maintains a large inventory of stainless steel raw material for immediate manufacturing and shipment of most shaft sleeves within a few days. Ask about how ADM's unique hard coated pump sleeves reduce maintenance cost and downtime by as much as one half and makes your equipment work harder and longer. Write or call Today

Along with **TC-60™**, we offer a large variety of other coatings such as:

- Tungsten Carbides
- Ceramics
- High Cobalt Alloys

As well as:

- Pumps, Equipment & Repair Services
- Custom Fabrication
- Custom Machining



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*...the heart of the matter*

**We Are ASME & TSSA Certified!**



## FACTS ABOUT HARDCOATING

There are four basic 'families' of hardcoating materials used for shaft sleeves. These are" Ceramics, Tungsten Carbides, Cobalt base alloys (Stellite™) and Nickel Chrome Boron Base alloys (**TC-60™**). We have evaluated all of these materials and have selected TC-60™ as performing best in most applications. We will discuss the properties of the ceramic, tungsten carbide, and cobalt materials and our reasons for choosing **TC-60™** alloy.

**TC-60™** has consistently shown the best results in both increased sleeve life and packing life. This is not a common composition as very few nickel chrome boron alloys contain copper and molybdenum. The addition of these and other elements substantially improves the corrosion and abrasion resistant properties. **TC-60™** is a dense, pore-free, fused coating that will not chip or crack. It has a very low coefficient of friction, greatly increasing packing life, and has excellent resistance to both abrasion and corrosion. The hardness of the coating is 60 on the Rockwell 'C' scale or approximately 675 Brinnell. The finished coating is usually .080" thick on the sleeve diameter (sleeves with a thin wall might have less coating). Our normal surface finish is 4-8 RMS, and dimensional tolerances are equal to or closer than those specified. Our shaft sleeves are mandrel ground to assure total concentricity.

Ceramic Materials are porous, mechanically bonded, and fragile. They are sapphire-hard, but most ceramic users report about a 50% premature failure rate of the ceramic coated sleeve. Being porous, any corrosive media being handled can penetrate the coating, attack the base metal, loosen the bond and cause the coating to fall off. Ceramic material has an extremely low coefficient of expansion. When subjected to elevated temperatures, the base metal expands while the coating does not, then the coating cracks and falls off. This fact also makes them unsuitable for sleeves that are shrink fitted to the shaft. Also, the coating can be dislodged by excessive vibration in the equipment or careless handling during installation or storage. While **TC-60™** Sleeve can be shrink fitted without problems.

Tungsten Carbide materials are composed of particles of tungsten carbide in a matrix of either a cobalt or a nickel base alloy. They are extremely hard, are fused to the base metal and cannot come off. Tungsten carbide coatings can be compared to concrete. The particles of tungsten carbide would be like gravel in concrete and the matrix would be like the cement. Depending on the material being pumped, the matrix will corrode or abrade away leaving the particles of tungsten carbide projecting, therefore the surface wears rough instead of smooth, greatly reducing packing life. While the **TC-60™** coating extends packing life.

Cobalt alloys are also fused coatings and cannot come off. They range in hardness from Rc 25 to Rc 55. The most common trade name for these materials is 'Stellite™'. These materials have good corrosion and abrasion resistance (depending on the hardness), a low coefficient of friction and as such, do make a good shaft sleeve. However, being more expensive and softer this alloy is only recommended for applications where sulphurous acid and nitric acid are encountered, otherwise **TC-60™** will out perform this coating.

**TC-60™** Sleeves offer greatly reduced overall maintenance cost on your equipment. Better sealing at the packing area will reduce bearing failures by preventing the material being pumped from leaks and entering the bearing housing, displacing or contaminating the oil, causing the bearing to fail. When the bearings fail, they usually destroy either the shaft, bearing housing or both, and allow the pump element to shift position or whip about, damaging impellers, wear rings, casings and heads.

Some customers have been using the **TC-60™** Sleeves for the last 30 years, indicates their over-all pump maintenance costs (packing, bearings, shafts, impellers, wear rings, casings and most important, downtime) has been reduced to less than one-half of their previous level.



**Call ADM Stainless Inc. Today!**